Summary of Changes to 2009 Flood Risk Management Resource Management Strategy

Introduction

- Changed title to Flood Management
- Added description of "Flood Management"
- Added description linking future of Flood Management to IWM

Background

Expanded background understanding of flooding in California

- Number of people and property exposed
- Quantity of flood infrastructure
- Historical Funding
- Figures on exposed people, property, agriculture, and environmental resources as well as types of flooding in California. Some of the graphics are placeholders and will be finalized when analysis is complete.

Description

Existing flood risk management categories revised to nine flood management action categories with 103 specific management actions. The nine categories are:

- Floodplain Conservation and Restoration
- Floodplain Management
- Flood Infrastructure
- Floodplain and Reservoir Storage and Operations
- O&M
- Flood Preparedness, Response, and Recovery
- Policy and Regulations
- Permitting
- Finance and Revenue

Attachment A shows summary table used in RMS.

Table 1 provides a linkage to where actions within old categories can be found.

Table 1: Alignment of Old and New Management Actions

2013 Flood Risk Management Action Categories	2009 Flood Risk Management Categories
Floodplain Conservation and Restoration	Structural Approach
Floodplain Management	Structural Approach
Flood Infrastructure	Structural Approach
Floodplain and Reservoir Storage and Operations	Structural Approach
O&M	Structural Approach
Flood Preparedness, Response, and Recovery	Disaster Preparedness, Response, and Recovery Recommendations
Policy and Regulations	Land Use Management
Permitting	Land Use Management
Finance and Revenue	

Connections to Other RMS'S

- Previous Flood Management RMS featured connections to the following RMS's: Conjunctive Management and Groundwater; Conveyance; Surface Storage; System Reoperation; Urban Runoff Management
- Also added connections to the following RMS's**:** Ecosystem restoration, Sediment management, Land Use planning and management, Watershed management, Agricultural lands stewardship, Forest management, Pollution prevention, Water-dependent recreation, Outreach and education.
- Instead of only highlighting how RMS's that provide flood management benefits, described a diversity of cross-linkages/synergies to other RMS's

Added a matrix showing flood management approaches and other RMS's as Appendix A

Potential Benefits of Flood Management

- Added narrative description of benefits of an IFM approach, flood damage reduction benefits, and other benefits
- Created two case studies, one highlighting a single project providing multiple benefits (San Diego River Improvement Project) and a second highlighting multiple flood management approaches can be combined to address a variety of flooding issues in a single project (Lower Carmel River Floodplain Restoration and Flood Control Project)

Potential Costs of Flood Management

- Summarized initial and annual costs qualitatively as well as in the management action table in Appendix A

Issues

- Revised issues to match those indentified by Flood Future Report research and information gathering effort

Recommendations

- Use broad recommendation strategies from Flood Future Report as a starting point for the CWP 2013 RMS recommendations
- Included 2009 recommendations that were not addressed, where applicable

Attachment A: Flood Management Action Categories

Flood Management Action Category	Specific Management Actions	Potential IWM Opportunities	Potential IWM Challenges
Floodplain Conservation and Restoration	• Manage runoff through watershed management • Develop hazardous waste and materials management protocols • Operate reservoirs with flood reservation space to more closely approximate natural flow regimes • Reduce the incidence of invasive species • Remove barriers to fish passage • Set back levees to connect rivers to floodplains • Encourage natural physical geomorphic processes • Improve the quality, quantity, and connectivity of wetland, riparian, woodland, grassland, and other native habitat communities	• Improved ecosystem functions and habitats • Invasive species management • Potential to enhance recreation and open space • Possible water supply benefits by increasing groundwater infiltration	• Complex institutional, jurisdictional, and funding issues
Floodplain Management (*floodproofing, easements/ acquisitions, risk awareness, insurance*)	• Reduce flood damages through acquisitions, easements, and private conservation programs • Manage municipal stormwater to provide regional or systemwide flood benefits • Coordinate and streamline floodplain mapping • Develop mandatory flood insurance programs that are more consistent with the area's risk of flooding • Develop a State program and framework to reduce or eliminate subsidies for repetitive loss properties in floodprone areas • Construct flood infrastructure that would redirect floodwaters, subdivide larger basins, or isolate inundation • Improve awareness of floodplain function and risk through outreach and education	• Potential to create open space, recreation, and ecosystem habitat opportunities • Promote collaboration between water resource management agencies and land use entities	• Land acquisition and/or land use conversion

Flood Management Action Category	Specific Management Actions	Potential IWM Opportunities	Potential IWM Challenges
Flood Infrastructure (*levees/floodwalls, bypasses, hydraulic structures, debris basins, storm surge barriers, etc.*)	• Improve conveyance by addressing flow constrictions • Increase capacity of existing bypasses • Modify existing structures to improve flood system performance • Construct new bypasses and levees or floodwalls • Raise levees to improve flood system performance • Construct closure structures and debris basins • Preserve active washes • Nourishment of dunes and beach • Construct storm surge barriers, armoring and shoreline stabilization structures	Depending on the type of infrastructure, integration opportunities can include: • Groundwater recharge • Improved ecosystem functions and habitats • Increased recreation opportunities • Improved water quality • Increased water management flexibility of reservoir operations	• Inappropriate water quality for recharge (e.g., pollutants, sediment) • Impedance to fish passage • Encroachment, right-of-way, land acquisition and land-use conversion issues
Floodplain and Reservoir Storage and Operations	• Construct new or enlarge existing floodplain storage • Increase on-stream flood storage capacity • Restore storage in existing reservoirs • Increase flood control Increase foothill and upper watershed storage • Increase flood control allocation by using spillway surcharge • Establish partnerships to coordinate flood management structure operations • Increase flood management flexibility through modifications to: the magnitude/timing of flood reservations in reservoirs, objective release schedules at flood management reservoirs and by implementing conjunctive use programs at flood management reservoirs • Implement advanced weather forecast-based operations to increase reservoir management flexibility	• Groundwater recharge • More natural hydrologic regimes to support floodplain ecosystem functions and habitats • Increased cold-water pool and operational flexibility for fisheries management • Increased recreational or open space areas • Improved water quality • Increased surface water storage and water management flexibility • Increased hydropower generation	• Poor water quality for recharge (e.g., pollutants, sediment) • Temperature-induced habitat changes • Land acquisition and/or land use conversion • Reserving storage for flood management reduces storage for water supply • Facility ownership and authorized purposes

Flood Management Action Category	Specific Management Actions	Potential IWM Opportunities	Potential IWM Challenges
O&M	• Restore channel form and function to improve O&M and facilitate flood damage reduction • Perform regular channel maintenance • Develop regional channel vegetation management plans • Develop encroachment management programs • Protect vulnerable levees and banks through stabilization and erosion repairs • Revise O&M manuals to be consistent with new and current policies that support multi-benefits of the flood system • Develop a long-term sustainable and implementable Levee Vegetation Management Strategy • Conduct dam safety inspections and investigations	• Beneficial reuse of dredged materials • Invasive species management • Revegetation of natural plants for erosion control • Livestock grazing for vegetation management	• Complex institutional, jurisdictional, and regulatory issues
Flood Preparedness, Response, and Recovery	• Coordinate flood response planning and clarify roles and responsibilities related to flood preparedness and emergency response • Improve communication and public awareness of emergency response procedures and terminology • Establish standard flood warning systems and procedures • Improve stream gage network for forecasting purposes • Establish or improve instrumentation for early warning systems for flood facilities • Create Emergency Action Plans to address dam failure • Protect critical infrastructure corridors from flood waters • Increase financial liquidity of local agencies during flood emergencies • Improve evacuation planning • Develop post-flood recovery plans • Purchase and pre-position flood fighting materials/tools in preparation for a flood event • Integrate environmental compliance and mitigation • Participate in the StormReady and TsunamiReady Program	• Promote collaboration among agencies and entities by coordinating communications tools and protocols, shared training opportunities for standardized emergency management systems and Flood-Fight Methods, common or integrated flood emergency action plans, and shared vulnerability assessment and awareness • Build stakeholder support • Reduce potential damages and liabilities and improve overall financial stability	• Overlapping/lack of jurisdiction among agencies and entities are confusing to both the public and governmental agencies at every level

Flood Management Action Category	Specific Management Actions	Potential IWM Opportunities	Potential IWM Challenges
Policy and Regulations	• Encourage compatible land uses with flood management system and floodplain function • Designate lands for dedicated flood flows • Use Building Code amendments to reduce consequence of flooding • Encourage multi-jurisdictional and regional partnerships on flood planning and improve agency coordination on flood management activities • Develop and implement criteria and processes for achieving a higher level of flood protection • Clarify flood management responsibilities for local, regional, State, and federal agencies	• Land use policies can create open space, recreation, water supply, and ecosystem habitat opportunities • Opportunities for greater coordination across agencies and jurisdictions	• Complex institutional, jurisdictional, regulatory, and funding issues
Permitting	• Develop regional and corridor conservation plans, or expand existing regional conservation plans to provide a more efficient and effective regulatory approval process for flood projects • Develop regional advanced mitigation strategies and promote networks of both public and private mitigation banks to meet the needs of flood and other public infrastructure projects • Develop proactive integrated regulatory compliance strategies that streamlines permitting activities • Establish memoranda of understanding (MOUs) and/or management agreements between agencies to integrate the needs to be served by flood control systems • Increase understanding of environmental permits • Corridor Management Strategy	• Ecosystem habitat preservation and restoration	• Complex institutional, jurisdictional, and regulatory issues
Finance and Revenue	• Leverage funding from multiple projects to improve cost-effectiveness and efficiency of flood management projects • Develop funding mechanisms for O&M and new flood management improvements • Establish a methodology for evaluating benefits and costs on a systemwide basis to support economic justification for projects in all community settings	• Leverage multiple funding sources • Address legislative or jurisdictional restrictions on expenditure of funds	• Subject to potential legal challenges